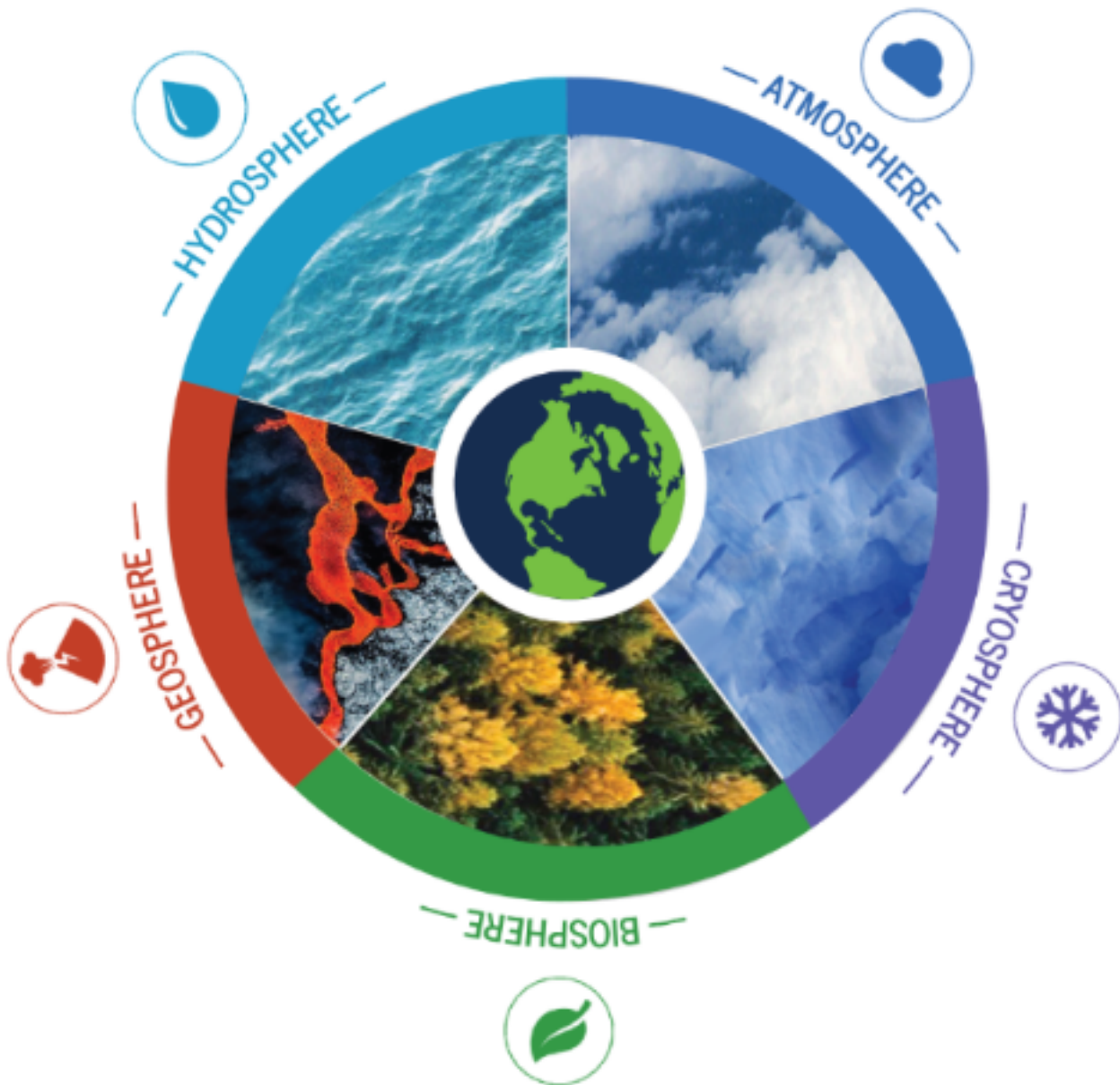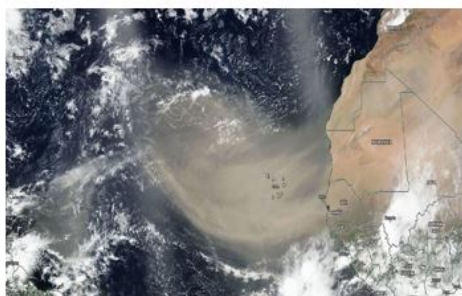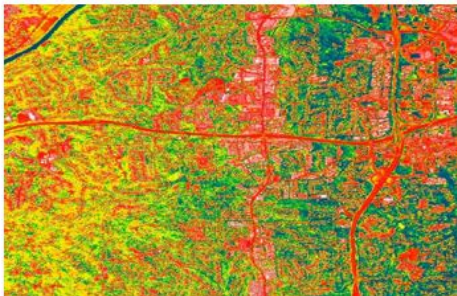# 5E Earth System Story Map Collections: Lesson Plans
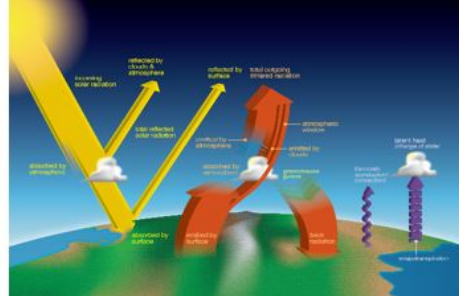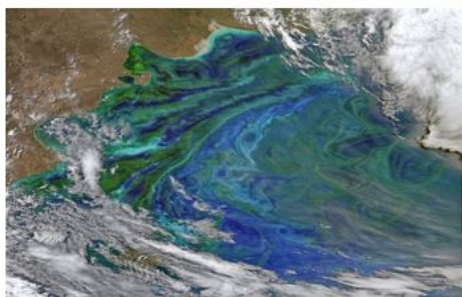
Air Quality

Creation of Urban Heat Islands

Earth's Energy Budget

Global Phytoplankton Distribution

Hurricanes as Heat Engines

Ocean Circulation Patterns

Sea Ice Extent and the Earth System

Solar Eclipse

Volcanic Eruptions

Are you looking for interactive lesson plans using visualizations and authentic data to address important processes and phenomena in the Earth System?

Check out these story maps. Story maps are an immersive means of storytelling by combining rich narrative text with interactive maps and NASA data, along with other multimedia content like images and videos in a 5E Model of the Earth System phenomena that you teach.

See full descriptions below the table:

Atmosphere

- Air Quality
- Creation of Urban Heat Islands
- Hurricanes as Heat Engines

Biosphere

- Global Phytoplankton Distribution

Cryosphere

- Sea Ice Extent and the Earth System

Geosphere

- Volcanic Eruptions

 Hydrosphere

 Earth as a System

- [Ocean Circulation Patterns](#)

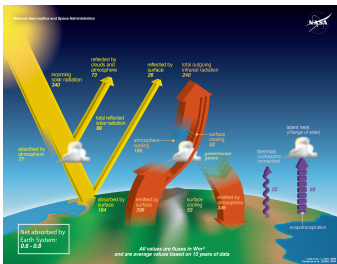- [Earth's Energy Budget](#)
- [Solar Eclipse](#)

Visit our Story Maps by clicking the links below:

1. In the [Air Quality Story Map](#) students analyze air quality index, pollutant concentration, and Nonattainment Area data to describe air quality trends over time. In the final section, students will use air quality data to make a prediction about the source of air pollution in a location.
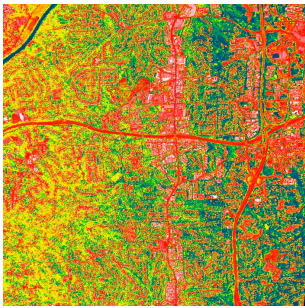
2. The **[Creation of the Urban Heat Island Story Map](#)** engages students in the exploration of the *urban heat island effect* using land surface temperature and vegetation data. Students also investigate the processes that create differences in surface temperatures, as well as how human activities have led to the creation of urban heat islands.

3. In the [Earth's Energy Budget Story Map](#), students learn about the different components of the Earth's Energy Budget, where in the Earth System energy is being absorbed and reflected, and how features of the Earth such as clouds, aerosols, and greenhouse gases, can cause variations in the flow of energy into and out of Earth Systems.
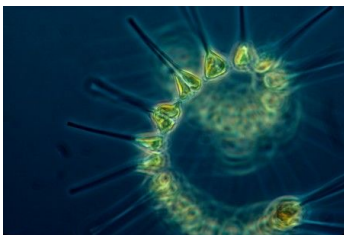
4. The ***[Global Phytoplankton Distribution Story Map](#)*** students use chlorophyll concentration data to explore global distribution patterns of phytoplankton. Students also investigate the processes that allow phytoplankton populations to thrive, as well as how their role in

the carbon cycle affects the other spheres of the Earth System.
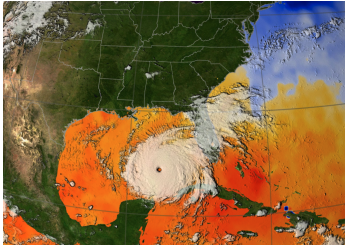
5. In the ***Hurricanes as Heat Engines Story Map***, students use various visualizations (i.e. images, charts, and graphs) to explore the energy exchange that occurs when hurricanes extract heat energy from the ocean. Using sea surface temperature data, they simulate the conditions that allow hurricanes to form, and observe the effects of hurricanes on the Earth System.
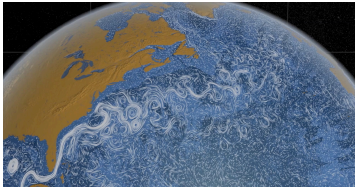

6. In the [Ocean Circulation Patterns Story Map](#) students analyze ocean circulation patterns as they relate to the world's ocean garbage patches using NASA ocean currents data. Students investigate the forces that contribute to ocean circulation patterns, and how debris, especially plastics, travel from land to garbage patches, as well as how humans have contributed to ocean plastic pollution.

7. In the ***Sea Ice Extent and the Earth System Story Map***, students explore changes in sea ice extent as it relates to other spheres within the Earth System. They also develop an iterative concept map that they will use to document their understanding of the Earth System as it relates to changes in sea ice.

8. In the [Solar Eclipse Story Map](#), students explore how living with a star can teach us about our universe. Through a series of learning activities, students examine the benefits and hazards of living with a star, describe and/or demonstrate how we use eclipses to study the Sun and its features, and investigate how our Sun may be used to learn about other stars and our universe.
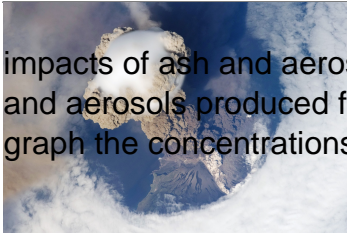
9. In the [Volcanoes Eruptions Story Map](), students explore the formation and impacts of ash and aerosols from volcanic eruptions around the world. They also investigate how ash and aerosols produced from volcanic eruptions are hazardous to the human ecosystem. Students graph the concentrations of aerosols from a volcanic eruption over time.